SHORELINE RESTORATION PLAN

CITY OF FORKS

Prepared on behalf of:

City of Forks
Planning Department
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Prepared with funding from:

DEPARTMENT OF ECOLOGY
State of Washington

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THE WATERSHED COMPANY

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1 Introduction

1.1 Guidelines

An ecological system is made up of many interacting and interdependent chemical and biological components that, as they exist at any given time, produce habitats and shoreline landscapes. Ecological functions are the roles these systems play or the work they do (either alone or together) within the ecosystems. The Department of Ecology guidelines as established in the WAC are designed to assure no net loss of the ecological functions needed to sustain a shoreline's natural resources and to restore impaired functions (WAC 173-26-201(2)(c) and WAC 173-26-186(8)).

According to the WAC, methods to manage shorelines to sustain ecological functions include:

- Ecosystem-wide processes such as those associated with the flow and movement of water; sediment and organic materials; the presence and movement of fish and wildlife; and the maintenance of water quality.

- Individual components and localized processes such as those associated with shoreline vegetation, soils, water movement through the soil and across the land surface, and the composition and configuration of the beds and banks of water bodies.

The Department of Ecology's *Report on Restoration Planning* describes the components local governments should include in a restoration plan. They are:

- Gather information about existing land use patterns, critical areas, the degraded areas with restoration potential, special interest areas, public access areas, and channel migration zones.

- Conduct an inventory to characterize the shorelines and analyze the information to determine that is healthy, what is degraded or impaired, and what may be restored.

- Consider use of all existing analyses conducted by other governmental agencies that contribute to the characterization.

- Design policies, regulations, and restoration plans based on data collected in the inventory and as described in the characterization using "environment designations" as a tool for determining acceptable uses in particular locations:

- Regulate shoreline uses so that no net loss results, and coordinate restoration plans with other local policies and regulations.

- Focus restoration plans on tools such as economic incentives, broad funding sources, volunteer programs, and other strategies.

1.2 Shorelines in City Jurisdiction

The purpose of this Plan is to provide additional information specific to shorelines of the state located within Fork's City limits based on the WRIA 20 Shoreline Inventory and Characterization Report, which is prepared as a required component of the Shoreline Master Program (SMP) update. The City of Forks intends to adopt the updated Clallam County SMP for implementation within city limits, as applicable, per Resolution No. 398 (August 2010). The City has been an active participant in the County's SMP Update, including the advisory committee during the early phase of the process.

The Restoration Plan Addendum is prepared to supplement the Clallam Countywide Restoration Plan. The geographic scope of this Addendum focuses on the segments of the Calawah River, Elk River, lower Mill Creek, and adjacent associated shorelands (e.g., floodplains and wetlands) located within the City's SMP jurisdiction. Clallam County retains shoreline jurisdiction in the Forks Urban Growth Area (FUGA) until the City takes over jurisdiction for the management of shorelines in those areas via annexation.

The Restoration Plan is meant to help identify restoration or enhancement projects and areas of the shoreline for improvement. Generally, uses and developments within shorelines cannot always be fully mitigated, which may result in incremental and unavoidable degradation to the baseline conditions of the shoreline. The Restoration Plan document aims to counter these incremental degradations by identifying areas and projects for enhancement and restoration which can improve degraded baseline conditions along the shoreline over time. Specific reaches identified by Clallam County located within the City of Forks include: Calawah 10, Calawah 20, Elk Creek 10, and Mill Creek. See Appendix A for the City of Forks Shoreline Environment Designation Map.

2 Existing Conditions

Identification of restoration efforts rely partly on the WIRA *Inventory and Characterization Report* that includes, among other data, an inventory of existing ecosystems and their ecological functions, specifically those located on portions of the waterbodies that Clallam County manages and regulates. The *Inventory and Characterization Report* also references other local, regional, and statewide management plans that provide insight, data, and methodology to guide restoration efforts. The Calawah River System and the Bogachiel River System contain reaches that lie within the City of Forks SMP jurisdiction.

The following discussions summarize the existing conditions, areas of concern, and ways to improve the ecological condition of areas within Fork's shoreline jurisdiction, through ongoing and/or new restoration efforts.

2.1.1 The Calawah River System

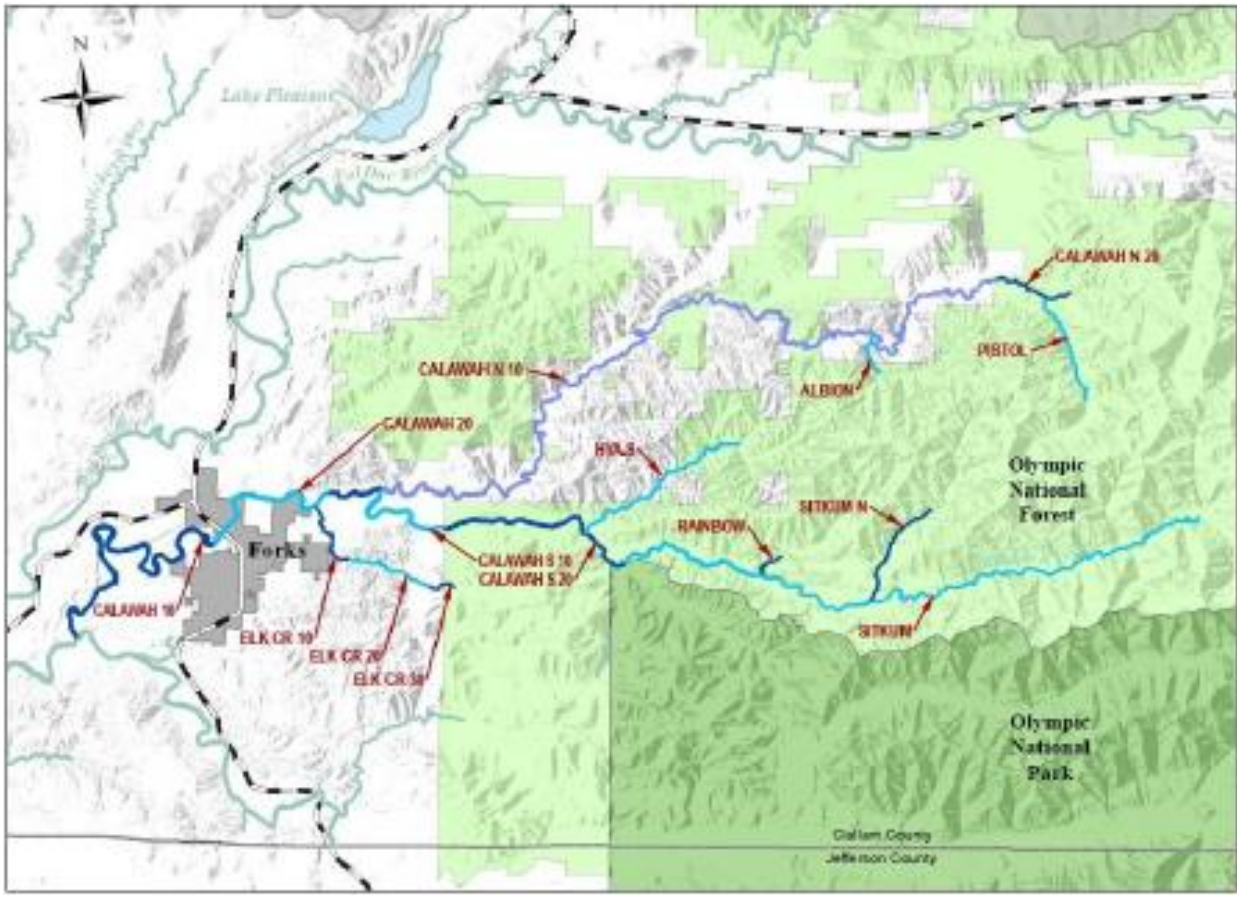

Figure 1: ***WRIA 20 Draft Inventory Characterization Report, June 30, 2011***

CALAWAH 10 and CALAWAH 20 Reaches:

The Calawah River System is the largest tributary of the Bogachiel River and is formed by the confluence of the north and south forks of the Calawah. The two forks of the Calawah, CALWAH N 10 and 20, and CALAWAH S 10, originate in the Olympic Mountains. All but one mile of the South Fork Calawah within the SMP study area flows exclusively through federal and state commercial forest lands; a one mile stretch near the mouth serves as an eastern boundary of the Forks Urban Growth Area (FUGA). The Calawah's North Fork is 20 miles long and flows through a mix of private and public commercial forest lands before it empties into the mainstem at the FUGA boundary. The mainstem reaches, (CALAWAH 10, CALAWAH 20, and CALAWAH 30), and a segment of its tributary, Elk Creek, pass alongside or through the FUGA. With the exception of the stream reaches that flow through FUGA and the reach to the west of FUGA, the shorelines surrounding the Calawah system contain few residences and are from utilities and paved roads (UW Olympic Natural Resources Center, 2011).

Historically, the watersheds were dominated by old-growth Sitka Spruce, western hemlock, and alder; the conditions have been altered to now be dominated by 37% alder in the riparian zones. The Calawah riparian area within SMP jurisdiction is composed of 83.4% closed canopy, 15.3%

other natural vegetation, and 1.4% non-forest. The Calawah system's Chinook, coho, and winter steelhead stocks have been rated as healthy. The conditions of the Calawah's sockeye, summer steelhead and chum stocks are unknown. The mainstem Calawah contains spawning habitat for fall, spring, and summer Chinook, as well as winter steelhead. Coho, fall chum, sockeye, and summer steelhead are present throughout the mainstem. One of the most productive areas for coho spawning and rearing is found in the Elk Creek reaches. It is reported that 30% of the coho in the entire Calawah system spawn in Elk Creek. Spawning habit is limited to the north fork reaches and its quality has been rated as "fair" throughout the drainage. The quantity of pool habitat rated "poor" to "fair" throughout CALAWAH N 10 and 20.

The shorelines dedicated to residential land uses include the reaches that border and pass through the FUGA: CALAWAH 10, most of CALAWAH 20 and 30, and the first 1.5 miles of CALAWAH S. These reaches included areas zoned as Industrial, Western Region Rural Low, Tourist Commercial, Public, and Urban Residential Low Density zone.

Recent studies have indicated that habitat conditions are improving with the reduction in timber harvests in the surrounding watershed of CALAWAH 10 and 20. Vegetation age is mature in contrast to other western Washington watersheds, resulting in a "good" rating for hydrologic maturity. CALAWAH N 20 has wide buffer zones and "good" large wood debris (LWD) levels, LWD recruitment potential, and riparian conditions. CALAWAH S 10 has been identified as "in recovery from past timber harvests" by recent studies. Near-term LWD recruitment potential is high, and naturally low shade exists throughout the majority of the lower CALAWAH S 10.

The WRIA 20 ICR has identified sedimentation from forest service logging roads that were constructed alongside major rivers and streams as among the highest priority problems in this subbasin. Restoration of adequate LWD levels has been identified as a restoration priority in the north fork drainage. Additional areas of concern include armoring on CALAWAH 20 under the Highway 101 Bridge and potential armoring at logging roads across the Calawah and its tributary rivers in various places throughout the subbasin.

ELK 10 Reach:

ELK 10 is part of the Calawah River System, with most of the reach flowing through private land within FUGA. Zoning designations include Commercial Timber, Rural, Urban Residential Low, Low Density, and Public Land. Habitat rating is "fair" due to riparian road impact, but fall Chinook, coho and winter steelhead all have healthy stock status rating. Summer steelhead status is unknown.

Areas of concern identified within the WRIA 20 Inventory and Characterization Report (ICR) include riparian road impacts on ELK 10 that affects coho, steelhead and fall Chinook salmon spawning.

2.1.2 The Bogachiel River System

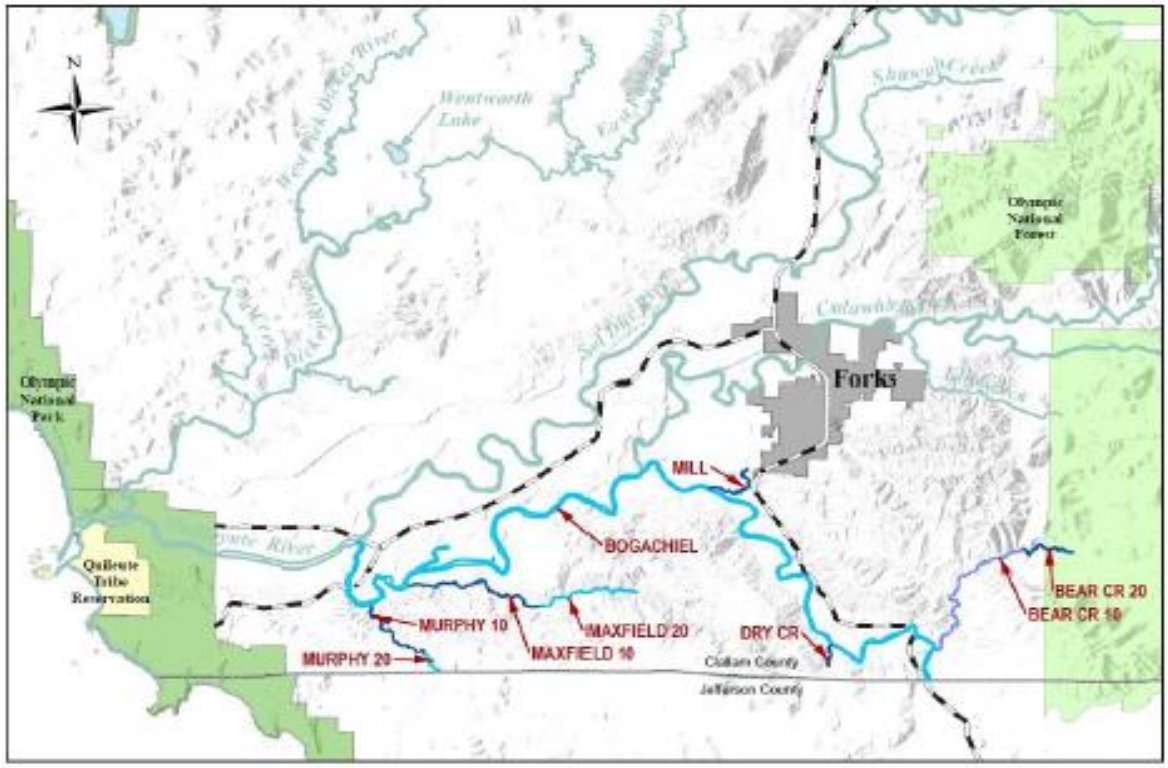

Figure 2: *WRIA 20 Draft Inventory Characterization Report, June 30, 2011*

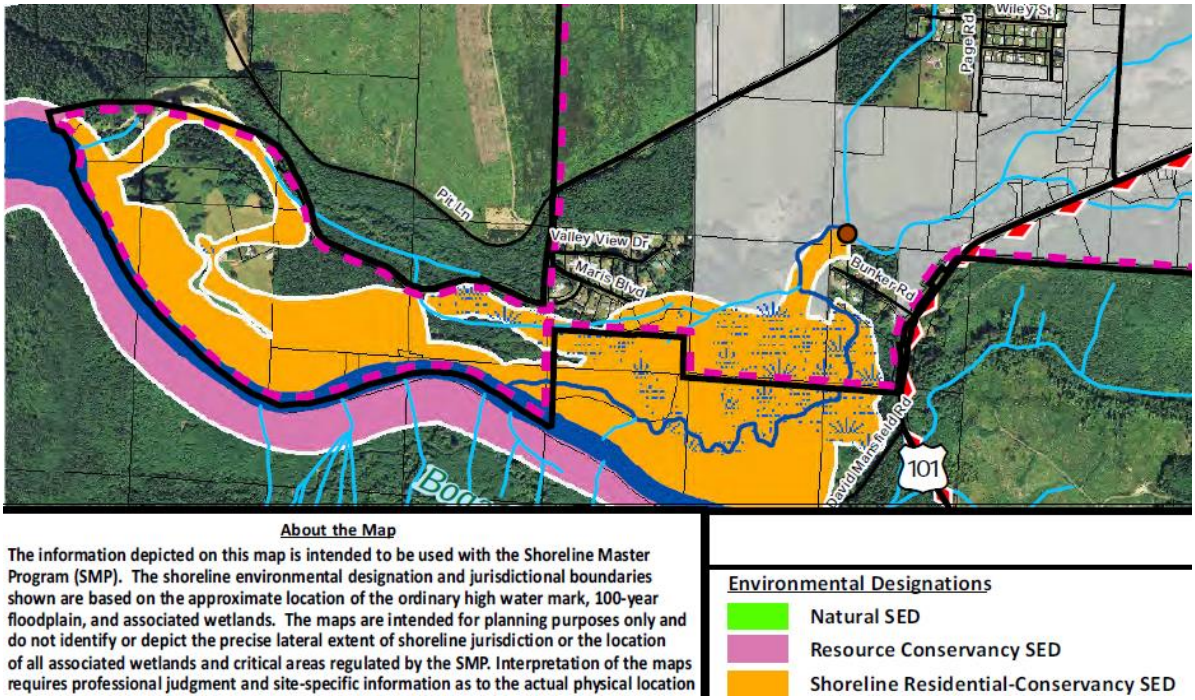

Figure 3: *Mill Creek reach (red dot) – City of Forks is in gray; FUGA is pink dashed line – 2010 City/County SED map, Clallam County SMP*

Mill Creek Reach:

The headwaters of the Bogachiel River lie outside of the current planning area in the steep terrain of Olympic National Park. West of the Forks UGA, its largest tributary, the Calawah River, flows into the Bogachiel. The portion of the Bogachiel that flows through the FUGA extends from River Mile 8.9 to 10.1, at the southwest boundary of the City Limits. Much like the Calawah, the Bogachiel River provides spawning and rearing habitat for spring, summer, and fall Chinook, coho, and chum salmon, as well as for winter steelhead, with salmon runs assigned a "Healthy status". The riparian condition of the segment that passes through the FUGA has been rated as "Fair", but the LWD condition of that segment has been rated as "poor".

Upstream of the Bogachiel River, Mill Creek becomes a Shoreline of the State immediately northwest of Bunker Road/US HWY 2 intersection, as indicated by the red dot in the Shoreline Environment Designation Map (see Figure 3 above). The ICR recommends the segment of the Bogachiel River mainstem portion within the Forks UGA be given careful consideration if development permitting is sought, as the reach passes through a critical aquifer recharge area and may include associated wetlands at the mouth of Mill Creek.

Areas of concern have been identified within the WRIA 20 ICR and include armoring associated with bridges throughout a number of the Bogachiel River segments, and knotweed control throughout the Bogachiel drainage, including associated wetlands of Mill Creek in City limits. Other assessment recommendations included improvement of riparian buffers to increase the supply of LWD, decreasing inputs of coarse and fine sediments, expansion of channel complexity and roughness, and reduction of flow limitations to fish passage.

According to the Department of Ecology, "no net loss" requires sustaining habitat functions such as: 1) the flow and movement of water, sediment, and organic materials; and, 2) the presence and movement of fish and wildlife and maintenance of water quality. This includes attention to shoreline vegetation and soils as well as water movement through soils, and particularly water movement across land surface and the composition of beds and banks next to water bodies.

The City of Forks has been a partner to the County for ongoing projects and programs and will continue to help integrate restoration with shoreline management and land use. The City faces several obstacles that may hinder or prevent local restoration efforts, including lack of funding, landowner participation, project permitting, and climate change. However, tools do exist to enable a local government to work toward achieving restored ecological functions. Everything from stringent local development regulations that impose authority to lively public education programs that elicit participation; these tools work together to improve shorelines.

To that end, a number of ongoing collaborative efforts are at work. The following list describes the complex and continuous activities involving state, county, tribal, and local government; and individual participation—all determined to improve the water quality, shoreline habitat, and overall enjoyment of the river systems and their tributaries.

2.2 Restoration Opportunities & Ecological Functions

2.2.1 Clallam County near Forks

North Pacific Coast Lead Entity

The North Pacific Coast Lead Entity is comprised of Watershed Resource Inventory Area (WRIA) 20. The area encompasses 935,250 acres that drain into the Pacific Ocean. The largest drainage is the centrally located Quillayute River watershed, with its four major sub-basins: the Dickey, Calawah, Bogachiel, and Sol Doc rivers. The primary goal of the Lead Entity is to maintain and improve ecosystem productivity and genetic diversity for all salmon species by protecting highly productive habitats and populations, and restoring impaired habitats and populations.

Restoration projects led by the North Pacific Coast Lead Entity are identified below:

Project	Project Description	Status (2021)	Notes
Forks Knotweed Removal	Treat knotweed infestations on 51 recorded sites.	Completed end of 2020, but likely on-going	The project began mid-2006 and ended in December of 2020.
Off Channel Habitat Assessment and Design	Investigate existing 54 off channel habitat sites previously identified and developed by WDFW.	Planning Stage	Initial assessment showed habitat sites are in an advanced state of disrepair.
Elk Creek Acquisition	The Wild Salmon Center used funding to purchase 255 acres of Elk Creek floodplain east of Forks city limits. The land was later transferred to the North Olympic Land Trust.	Completed in 2005	Project goal was to protect intact habitat from degradation.

2.2.2 City of Forks

The shorelines within the City of Forks' jurisdiction have minimal development due to steep and challenging building conditions. As such, significant developmental changes in the future are unlikely. The City recognizes that its' continued participation in upstream restoration efforts is the best means to improve ecosystem functions as a whole. As shown in the Table below, the City has been actively involved with such efforts for decades and have seen the continued benefits of involvement.

Along with the regulations and policies identified in Chapter 3.9 (Restoration) of the Clallam County SMP, the City of Forks encourages landowners to voluntarily implement restoration efforts. SMP Chapter 3.9.2 (6) describes the expedited permit process for fish habitat or passage improvement projects. As stated in the County SMP, restoration actions should improve

shoreline ecological functions and processes, as well as shoreline features, thereby promoting sustainability of sensitive and/or regionally important plant, fish, and/or wildlife species and their habitats. The City supports both voluntary and cooperative restoration efforts between local, state, ad federal public agencies, Tribes, non-profit organizations, and landowners to improve shorelines with impaired ecological functions and/or processes.

The City of Forks is actively involved in restoration efforts and on-going projects identified below:

Project	Project Description	Status (2021)	Notes
Culvert removal/replacement	Culvert removal/replacement along tributaries to Mill Creek.	On-going	Restoring fish passages.
North Pacific Coast Lead Entity Group	Maintain and improve ecosystem productivity and genetic diversity for all salmonid species in the North Pacific Coast area.	On-going	The City of Forks is a primary participant in the North Pacific Coast Lead Entity.
Warner Creek Monitoring	Annual alternative school student macro-invertebrate sampling at confluence of Warner and Mill Creek.	On-going	On-going since 1997. As of 2019, large diversity of macro-invertebrates.
Mill Creek Water Quality	Annual water quality samples near the mill on Mill Creek.	On-going	
WRIA 20 Watershed Management Plan	WRIA 20 Watershed Management Plan	Completed	Completed participation in 2011.

2.2.3 Quileute Tribe

As an overarching goal, salmon habitat restoration and improving ecological functionality are top restorative priorities within and near Forks. The City of Forks has a long-standing tradition of coordinating restoration projects with the Quileute Tribe. The Tribe works with timber landowners and state and federal agencies to assess habitat status, prioritize projects, and implement restoration. Common projects include removal of fish passage blockages and installation of culverts that allow returning Coho and steelhead to access prime upstream spawning habitat. A key objective of this Restoration Plan is to continue fostering a cooperative partnership and coordinating restoration efforts with the Quileute Tribe.

2.2.4 Non-Profit Organizations

The City of Forks has historically supported and coordinated restoration work with non-profit organizations, including upstream projects that may have a positive impact downstream on shorelines within City jurisdiction. As a part of this Restoration Plan, the City will maintain its commitment to supporting non-profit organizations and their restoration efforts.

North Olympic Land Trust

The Land Trust has protected dozens of properties across Clallam County with an eye toward conserving quality and contiguous fish habitat. Key watersheds near the City of Forks for past and future efforts include Elk Creek and the Bogachiel River.

Pacific Coast Salmon Coalition

In 1990, the Washington State Legislature created the Regional Fisheries Enhancement Group (RFEG) Program to involve local communities, citizen volunteers, and landowners in the state's salmon recovery efforts. The Pacific Coast Salmon Coalition (PCSC) is one of fourteen REFGs that works within communities across the state to recover salmon. PCSC is located in Forks and is currently working with the Quillayute Valley School District to mentor and educate youths of all age levels. In November of 2019, PCSC received funding by the Family Forest Fish Passage Program to support efforts targeting fish barrier culvert removal and replacement with updated single box culverts.

10,000 Years Institute

The 10,000 Years Institute supports citizens and organizations who seek more in-depth, focused participation in the policies and agency actions that affect public resources. The Institute organizes complex technical information and helps develop scientific data to support public conservation initiatives and public participation in policy proceedings. Invasive species management is a component of the institute's watershed ecological service areas. In particular, knotweed is a threat to salmon and other wildlife habitat because it out competes native riparian plant species and create monocultures that provide little nutritive support for aquatic systems and poor erosion control along riverbanks relative to the native plant communities it displaces.

In 2002, the Hoh Tribe initiated a restoration project for the eradication of knotweed and riparian restoration on the Hoh River. In 2004, the 10,000 Years Institute continued the control work in partnership with the Hoh Tribe, Olympic National Park, the Department of Natural Resources, and Clallam and Jefferson County noxious weed control staff. The on-going project highlights the cooperation of Clallam County in knotweed eradication efforts, which are also prevalent within the City of Forks.

2.3 Additional Restoration Tools

The Department of Ecology also recommends considering other tools that have found success in similar jurisdictions.

2.3.1 Conservation Easements

Conservation easements place restrictions on deeds that run with the land and can be enforced for the life of the easement (preferably in perpetuity). A governmental agency or a 501(c)(3) non-profit land-holding organization may "hold" a conservation easement.

The holder of a conservation easement is responsible for annual monitoring and enforcing the terms of the easement. Conservation easements may be donated or purchased and many accrue

tax benefits and/or tax exemption status. The terms of the easement must meet the needs of both the landowner and the holder. Conservation easements may be used as a method to preserve and restore riparian corridors. In the case of Forks, such an easement may help provide areas of suitable salmonid habitat consisting of large woody debris and overhanging native vegetation, consistent with pre-disturbed riverine environments.

2.3.2 Low impact development, surface water, and storm water collection systems.

The City has a development policy that all new development must ensure that all stormwater is kept on site of the property associated with that development. In combination with the adoption and utilization of new storm water management regulations and programs associated with federal and state National Pollutant Discharge Elimination System Permitting (NPDES), low impact development systems mimic a site's predeveloped conditions, enhancing water quality over hard structures such as stormwater detention vaults and other stormwater collection systems. As a policy to support this stormwater strategy, low impact development should be evaluated as a first preference for all new development, unless determined infeasible, as mitigation for new development, where triggered within the Forks Municipal Code. Surface and storm water systems can be implemented and upgraded to better restore water quality by reducing runoff, improve groundwater recharge and reduce pollutants when opportunities present themselves.

2.3.3 Shoreline Enhancement

Replace woody debris

Woody species provide a greater number of habitat niches above water and below water from woody debris (i.e. egg laying sites for invertebrates and amphibians, predator perching sites for invertebrates and escape habitat for invertebrates, amphibians, and fish). In general, a variety of woody species will increase the species riches of the base of the food chain, thereby supporting more species higher in the food chain and increasing the overall resiliency and productivity of the regional ecosystems.

Knotweed Removal

Knotweed is a highly invasive weed species that has been observed in the City of Forks for several years. It is of concern because Forks is close to both the Calawah and the Bogachiel Rivers, both of which have knotweed. Since 2006, the Quileute Tribe and North Pacific Coast Lead Entity have been trying to eradicate and prevent re-infestation by encouraging herbicide trainings and treatments, monitoring, and retreatments when necessary. One landowner in particular with a large infestation still has not given permission to treat. Due to the close proximity to the river, working with and encouraging this landowner should remain a priority.

Voluntary Restoration on Private Lands

In conjunction with on-going regional and county-wide knotweed removal efforts, the City encourages voluntary restoration on privately owned properties. The eradication of knotweed is dependent upon successful cooperation efforts and continued partnerships between non-profits, Clallam County, the City of Forks, tribes, and private landowners.

Buffer Mitigation Education

The City plans to provide education tools for buffer mitigation on a project-by-project basis or in collaboration with Clallam County on applicable projects. Education is a key resource that can have positive impacts on shoreline buffers and associated mitigation sequencing.

3 Conclusion

The Clallam County Shoreline Master Program (SMP) demonstrates the County and City of Fork's commitment to conscientious protection and restoration of the shorelines along its rivers and tributaries. The policy direction in the SMP makes it clear that the City intends to use its development regulations and the State's regulatory authority to restore ecological functions wherever possible.

The SMP contains numerous recommendations that contribute to the restoration of the shorelines including:

- Remove degraded vegetation
- Regulate development within the critical aquifer recharge area
- Minimize the removal of natural vegetation; replant native species
- Employ soil bioengineering
- Manage knotweed infestations
- Locate parking away from water; share spaces when appropriate
- Continue to require all new development to keep stormwater on site
- Restore water quality by controlling setbacks, buffers, and storm water storage basins to lessen negative impacts
- Require construction practices that minimize effect on water quality
- Control surface runoff through treatment, release of surface water
- Use fragile or unique areas for non-intensive recreation
- Require setbacks for accessory uses
- Limit use of pesticides, fertilizer, toxic materials and prevent them from entering water
- Use bio-filtration systems to screen out pollutants; use grassy swales, retention ponds, and other vegetative features
- Prohibit residential development in critical areas
- Limit lot coverage

4 Source Materials

10,000 Years Institute. (www.10000yearsinstitute.org). Accessed February 26, 2021.

Clallam County, 2018. Clallam County Shoreline Master Program (SMP), Clallam County Department of Community Development.

Clallam County, 2010. Clallam County Shoreline Master Program (SMP) - Inventory and Characterization Report, Clallam County Department of Community Development, ESA Adolfson.

Harrison Barbara. 1999-2000. Mill Creek Monitoring Program Manual. University of Washington, Olympic Natural Resources Center.

Salmon Recovery Portal. (https://srp.rco.wa.gov/Site/100) Accessed February 9, 2021.

UW Olympic Natural Resources Center, 2011. Revised Draft WRIA 20 Inventory and Characterization Report [ICR]. Prepared by Gentry, Rebekah and Wecker, Miranda.